THE LANTAU GROUP
strategy & economic consulting

Lantau Pique

July 2012

In this edition

In this issue of Lantau Pique we argue that it is time for the single buyer model to evolve so as to better meet the needs of Asian countries.

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Does your Single Buyer make the very best bad decision?

Versions of the Single Buyer model have been a mainstay of the Asian power sector for decades. As government-owned power utilities struggled to keep up with rising electricity demand, the Single Buyer model offered a way to tap outside investors keen to participate in regional growth. And, for some, the Single Buyer model offered a way to introduce power sector reforms.

Yet, the track record of the Single Buyer model in Asia is mixed, at least from the consumers' perspective. In our view, the problems have not been so much with the signature elements of the Single Buyer model—power purchase agreements and independent power producers—but with the sometimes overly narrow objectives that the Single Buyer model is used to achieve. Too often, countries using the Single Buyer model wind up with a wrongly sized or poorly constructed portfolio of power purchase contracts, the cost of which has to be recovered from consumers, taxpayers or incumbent utility shareholders. In this edition of *The Lantau Pique*, we consider reasons why the Single Buyer model—and the competitive tender process in general—can sometimes result in the "very best, bad decision".

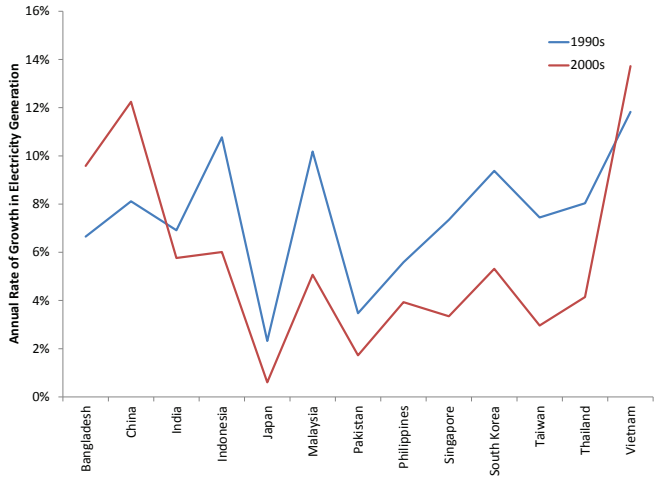
The conventional Single Buyer model relies on an entity—usually the incumbent utility, but sometimes a special purpose vehicle—to procure power under contract from various sources, each of which theoretically competes for the opportunity to supply electricity. The effectiveness of the Single Buyer model naturally depends on how it is used, how it is regulated, and what it is allowed or incentivised to do.

Think of the Single Buyer model as a weapon of power sector development – one sufficiently powerful that it has the potential to leave a costly wake of unintended consequences. If the Single Buyer can provide sufficient financial assurance (usually in the form of a "bankable" PPA) then the chosen project can proceed. The problem is this: a bankable PPA can make even the worst possible project commercially viable. No amount of Single Buyer excellence will offset the economic damage caused by poor planning that leads to the wrong type of plant or the wrong commercial structure. Given how effective the Single Buyer model can be when used to support project financing, the project being financed should be backed by some pretty awesomely prudent planning. Otherwise, the Single Buyer model risks being a way to spend more money, faster, but not smarter.

As more and more Asian countries advance economically, growth rates are slowing down. The raw urgency of building power stations to avert looming shortage is yielding to more complex planning concerns. Figure 1 highlights the slowdown in decadal average growth rates of electricity generation across many Asian countries. This slowdown signifies an opportunity to improve power sector decision-making. After all, failure to make sound infrastructure decisions can reduce national competitiveness.

Figure 1: Comparison of decadal electricity generation growth rates

Source: BP Statistical Review of World Energy 2012



But, what makes good planning? The ideal planning process involves a ***comprehensive*** evaluation of a wide range of alternatives so as to identify the very best choices. In a perfect world, a power station investment —the typical subject of a Single Buyer procurement process—should proceed only if it is better than a wide range of alternatives, including, *inter alia*, life extension or performance enhancement of existing capacity; demand-response; reliance on mobile, flexible or temporary power sources; transmission enhancement; or various combinations of these or other things.

In many ways this point should be all too obvious, as it is what one should expect from a well-regulated utility or from a firm operating in a competitive market in any sector. Yet, the tender process adopted by the Single Buyer model can constrain what is being tendered, sometimes going so far as to specify the technology, the location, the fuel and the size, when what is really being sought is simply electricity of some amount, with some delivery profile or flexibility, over some period of time. The resulting procurement process may appear highly competitive, but if it is too narrow or exclusionary then may not yield the best outcomes. The resulting proposals may be easier to evaluate—being of a standard technology, on a pre-selected site, and with a pre-selected fuel type—but making life easy for the investment evaluation committee is not something power consumers care much about.

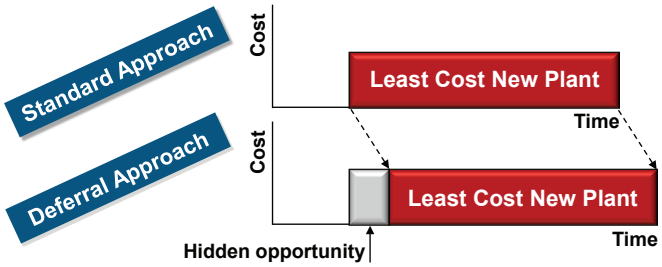
The presumption is that the planning function within the Single Buyer has the necessary incentives and perspective to identify the best resources to be procured. Yet, this presumption is no more likely to be true for the Single Buyer model than for the vertically integrated monopoly model it replaces. Simply put, a single room full of just a few people, however smart they are, may not think of what the best of many rooms full of just a few people can think of. Market-based processes create value when they incentivise and tap a wider range of ideas—through decentralised competition—and not just rely on a small group of dedicated planners.

Other problems also can exist. If the Single Buyer is separate from the entity that, later, will have to administer and pay for the contracts being tendered, then it may not have strong incentives to reliably produce least cost plans or even to administer effective, competitive tenders. The challenge in such instances is to develop structures and regulations that overcome these weaknesses.

The classic Single Buyer model can raise the cost of electricity supply costs for consumers in other ways as well. For example, the contracting and procurement structure may not reward the possibility of tapping incremental generation capacity from units that are already operating under contract. Or the contracted format may fail to reward other sources of flexibility and risk-management, such as under-valuing flexibility in fuel contracts.

Fixing these things is not easy. But, as the range and risks associated with potential electricity generation and demand-response options has expanded in the past decade, the complexity of the planning process and the possibility of missing valuable options have increased, greatly. If the Single Buyer model ignores potentially good options, significant value can be lost. Figure 2 illustrates this point in a simple way. The "least cost new plant" is the choice identified in the planning process. It sets a "price to beat". The hidden opportunity is the reward available from using a less structured (more open) procurement process.

Figure 2: Comparison of Decadal Electricity Generation Growth Rates



A decade or so ago, one Asian country locked in higher electricity generation costs by using PPAs to support natural gas-fired generation capacity capable of supporting the development of a major gas field. The result was the absorption by the grid of so much gas-fired generation that existing coal-fired capacity had to be backed down to make room for baseload gas-fired capacity to use up the more expensive natural gas. Setting aside consideration of environmental benefits of gas versus coal, the total cost of power—a considerable concern in that country—has been higher ever since. The Single Buyer model is only as good as it is allowed to be.

Another Asian country entered into a number of power purchase agreements (PPAs) with virtually no competition, a factor that raised power costs for decades. In the next several years, many of these contracts are expiring. Earlier this year, the regulator, announced a plan to run tenders for large amounts of combined-

cycle gas-fired capacity. Quite recently, the winner bested the incumbent utility in a robust competitive battle. But, with natural gas prices so high in Asia, gas-fired capacity may not be the most cost-competitive form of capacity addition. Even if gas-fired capacity is deemed desirable, it is possible that newer, more efficient, "H-class" CCGT technology, could prove so superior to existing CCGT technology that it is worth finding ways to defer commitment to current technology for a year or two just to better evaluate the possible savings. Or, perhaps, uncertainty related to gas prices in Asia due to uncertainties in future shale gas developments needs to be factored in—as such uncertainty has profound implications for fuel contracting. Or, perhaps, the power system will need more responsive capacity such that the different performance characteristics of reciprocating engines or demand-response will have particular value. Ideally, such factors will be incorporated in future procurement arrangements.

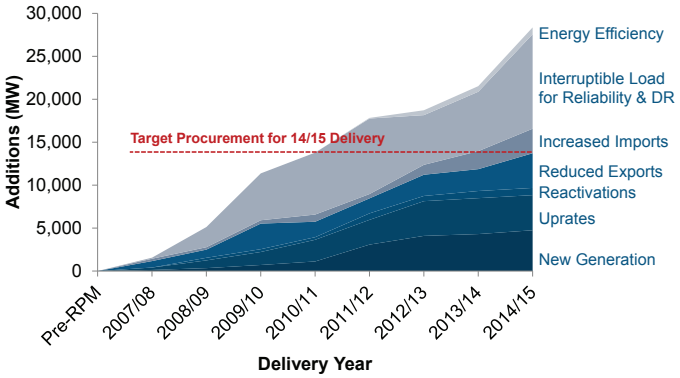
For evidence of what can be achieved, we find some compelling insights emerging from competitive markets. Consider the PJM market, one of the largest and most successful power markets in the world.

The PJM market uses auction mechanisms as well as market-based incentives to stimulate innovative solutions to capacity requirements. In 2007, PJM introduced the Reliability Pricing Model ("RPM") to replace a previously dysfunctional voluntary mechanism. The highly structured RPM serves as a market mechanism to procure capacity in the most economical way while maintaining system reliability. The forward structure of RPM auction signals expected investment needs. RPM auctions are designed to acquire capacity resources from one to three years in the future, with the base auctions held three years in advance of the "target" date. The forward auction structure allows time for new projects to be developed in response to expected and evolving market conditions and provides an assured source of revenue upon timely commissioning. Because different locations within the PJM system have different capacity requirements (taking transmission delivery capability and costs into account), the RPM divides the PJM system into a number of Load Deliverability Areas ("LDAs"), each of which is able to have its own unique clearing price based on bid capacity, demand response, energy efficiency, imports/exports, load expectations, and transmission constraints. Most importantly, the RPM is resource agnostic. If a resource meets the required attributes, it qualifies. The RPM incorporates a benchmark price concept called the "Cost of New Entry" – CONE. CONE is defined by a standard reference technology (open cycle gas turbine). The concept of CONE exists to ensure that the various parameters and settings that define acceptable RPM outcomes are consistent with commercially viable investment. Being a competitive market, PJM has a number of market power mitigation features, of which the CONE concept is one.

With just one exception, every year since its introduction the RPM has managed to clear at a capacity price below CONE—meaning that market participants have been able to identify capacity resources (supply- or demand-side) that are less expensive than the reference technology used to establish the CONE value.

The wide range of creative and innovative sources of capacity developed in the PJM market includes demand management, inter-connection; uprates of existing capacity; bringing back capacity from retirement; as well as new sources of generation as shown in Figure 3.

Figure 3: Sources of "capacity" in the PJM market



Source: 2011 PJM Assessment of RPM (The Brattle Group)

Is the extension of life of an otherwise retiring plant a better option than a greenfield new build? Is a reciprocating engine better than a diesel-fired gas turbine? Can a combination of short-term options cover the gap ahead of the introduction of a lower-cost coal-fired power station for base-load power? Can the environmental emissions differentials arising from different options be accommodated via flexible trading or offset regimes? Increasingly, with power generation costs increasing throughout Asia, it matters to get the right answers to these questions.

The point here is not to argue that all Asian countries need to adopt competitive market models like the PJM market. Not at all. Instead, the key insight is that more attention to the structure and nature of the procurement process—and particularly the specification of what is procured and how tenders are evaluated—can result in impressive savings.

Ultimately, the value of a Single Buyer model depends on how well it addresses the limitations of the monopoly utility model. To make the Single Buyer structure better than—rather than merely different from—the monopoly structure, keep three things in mind:

1) It's all about what you want to purchase, not how you want what you purchase to be generated. The prescription of what precisely the Single Buyer is attempting to procure should be as close to "electricity" as possible, and as far away from "electricity generated at this site, using that fuel and this technology". In other words, if you want to capture the possible benefits available from thinking innovatively and expansively about available options, then you have to challenge those who would compete to provide power to the Single Buyer to put

forward their very best options. The Single Buyer procurement framework should tap the imagination and ideas of any potential resource supplier—broadening the range of options for consideration and improving the chances that the very least cost option is selected.

2) It's all about competition. The power that the Single Buyer is attempting to procure needs to be competitively supplied. If there is no competition to supply the Single Buyer, then there is no force in play to improve upon what a monopoly utility might otherwise have been able to achieve (with much less fuss and bother). The design of the auction process is therefore of considerable importance. As consultants, we are forever surprised by the arbitrary limits imposed on qualification, participation or the auction design itself.

3) It's about methodology. The Single Buyer model needs the ability to evaluate options with different economic characteristics – different levels of fixed and variable costs; different construction periods; different potential interconnection points. To do this, the evaluation methodology needs to be up to the task. A reason for the prevalence of overly simplified Single Buyer tender processes is fear of complexity, and concern that challenging and more complex evaluation processes may be prone to gaming or corruption. In some contexts, hiring independent specialists can help address these concerns, as they can provide expert, objective assistance in the areas of auction process design and on the evaluation methodology and bid evaluation process.

Unless you are growing so fast that merely getting something done is the best outcome, it is worthwhile to find ways to expand the universe of options considered within the Single Buyer framework. Indeed, a poorly incentivised or regulated Single Buyer model can produce worse outcomes than those that a monopoly utility with coherent and comprehensive regulatory oversight would yield. Among other things, there may not be correct incentives for the Single Buyer to make the best decisions – especially if it is a special purpose entity that does not have to live with the financial consequences.

The key is not the "form" of the single buyer model, but its "substance". The Single Buyer should be able to achieve better outcomes than those that a vertically integrated utility would have achieved. Else, why bother? As Asian economies develop, "making better decisions" needs to become more important than "just build it and grow".